

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jason Sanders on June 9, 2009

The application has been amended as follows:

Claim 1, line 10, replace "100" with "50".

Claim 20, line 11, replace "100" with "50".

Claim 26, line 11, replace "100" with "50".

The following is an examiner's statement of reasons for allowance:

Claims 1-19 are allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including depositing a first portion of the silicate glass film over the substrate from a first gaseous mixture flowed into the processing chamber by chemical-vapor deposition; thereafter, etching the first portion by flowing an etchant gas comprising a halogen precursor, a hydrogen precursor, and an oxygen precursor into the process chamber, with halogen precursor being flowed into the processing chamber at a flow rate between 10 and 1000 sccm and the hydrogen precursor being flowed into the processing chamber at a flow rate between 50 sccm and 500 seem to control chemical interaction between the halogen precursor and the hydrogen precursor to provide a desired etch rate; and thereafter, depositing a

Art Unit: 1795

second portion of the silicate glass film over the substrate from a second gaseous mixture flowed into the processing chamber by chemical-vapor deposition.

Claims 20-25 are allowable over the prior art of record because the prior art of record does not teach depositing a first portion of the silicate glass film over the substrate by forming a plasma from a first gaseous mixture flowed into the processing chamber, the first gaseous mixture comprising a silicon-containing gas and an oxygen-containing gas; thereafter, etching the first portion by forming a plasma from an etchant gas mixture flowed into the processing chamber, the etchant gas mixture comprising a fluorine-containing gas, H₂, and O₂, wherein the fluorine-containing gas is flowed into the processing chamber at a flow rate between 10 and 1000 sccm and the H₂ is flowed into the processing chamber at a flow rate between 50 sccm and 500 sccm; and thereafter, depositing a second portion of the silicate glass film over the substrate by forming a plasma from a second gaseous mixture flowed into the processing chamber, the second gaseous mixture comprising the silicon-containing gas and the oxygen-containing gas.

Claims 26-28 are allowable over the prior art of record because the prior art of record does not teach depositing a first portion of the silicate glass film over the substrate by forming a plasma from a first gaseous mixture flowed into the processing chamber; thereafter, etching the first portion by forming a plasma from an etchant gas mixture flowed into the processing chamber, the etchant gas mixture comprising a first precursor gas reactive with the silicate glass film, a second precursor gas reactive with the first precursor gas, and an inert sputtering agent flowed into the processing

chamber, with the first precursor gas being flowed into the processing chamber at a flow rate between 10 and 1000 sccm and second precursor gas being flowed at a flow rate between 50 sccm and 500 seem to control chemical interaction between the first and second precursor gases to provide a desired etch rate, and with the inert sputtering agent flowed at a respective flow rate to control relative isotropic and anisotropic contributions to the etching; and thereafter, depositing a second portion of the silicate glass film by forming a plasma from a second gaseous mixture.

The closest prior art of record to Papasouliotis et al. (U.S. Pat. 6,846,745) fail to teach flowing a halogen precursor at a flow rate of 10 to 1000 sccm and the hydrogen precursor being flowed at a flow rate of between 100 to 500 sccm to control chemical interaction between the halogen precursor and the hydrogen precursor to provide a desired etch rate. While Papasouliotis et al. teach SiH₂F₂ as a potential precursor Papasouliotis et al. fail to teach separate flows of the halogen and hydrogen precursor and the specific flow rates thereof. Furthermore while Bayman et al. (U.S. Pat. 6,596,654) of record suggest the use of hydrogen during a deposition process does not teach the use of hydrogen during an etching process as claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
June 17, 2009